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Assessment

Cross-cultural adaptation and validation of the health literacy assessment tool METER in the Portuguese adult population

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ABSTRACT

Objective: We aimed to culturally adapt and validate METER in the Portuguese population, and to define cut-off values for adequate health literacy.
Methods: We used the standard procedure for the adaptation of the words and surveyed health professionals to select the non-words. The instrument was administered to a total sample of 249 participants and retested in a sub-sample of 45 after three months. Cut-offs were defined using the modified Angoff procedure. Construct validity was assessed through association with educational attainment and health-related occupation.
Results: Exploratory factor analysis revealed two dimensions of the instrument, one for words and another for non-words. METER showed a high degree of internal consistency, and acceptable test–retest reliability. Adequate health literacy was defined as scoring at least 35/40 in words and 18/30 in non-words. Physicians scored higher than any other group, followed by health researchers, researchers from other areas and by people with progressively lower levels of education ($p < 0.001$).
Conclusion: We culturally adapted a brief and simple instrument for health literacy assessment, and showed it was valid and reliable.
Practice implications: The Portuguese version of METER can be used to assess health literacy in Portuguese adults and to explore associations with health outcomes.

1. Introduction

Individual health literacy is the degree to which individuals have the capacity to obtain, process, and understand basic health information and services needed to make appropriate health decisions [1]. Inadequate health literacy is more prevalent among the elderly, those with lower levels of educational attainment [2] and with chronic disease [3]. It is associated with poorer self-management skills, less successful navigation of the healthcare system, higher morbidity and mortality [3–6].

The European Health Literacy Survey 2011 [7], conducted in eight European countries (Austria, Bulgaria, Germany, Greece, Ireland, the Netherlands, Poland, and Spain) found that only between 36.7% (in Spain) to 76.3% of the population (in the Netherlands) had adequate health literacy, as assessed by the Newest Vital Sign [8]. In Portugal, although health literacy has started to appear in the national political agenda [9], there are no published studies on the prevalence of adequate health literacy.

Health literacy is commonly measured using instruments based on word recognition or pronunciation: Medical Term Recognition Test (METER) [10], Rapid Estimate of Adult Literacy in Medicine (REALM) [11], Short Assessment of Health Literacy for Spanish-speaking Adults (SAHLSA) [12], Medical Terminology Achievement Reading Test (MART) [13]; or reading comprehension and numeracy: Newest Vital Sign (NVS) [8], Test of Functional Health Literacy in Adults (TOFHLA) [14]. Most instruments were initially developed in English or Spanish and are being adapted worldwide

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[15–19]. Word pronunciation-based instruments perform well in English but have failed adaptation to languages with very high letter to sound correspondence (such as Spanish, Portuguese and Korean) because they are unable to discriminate between health literacy and ability to read [12,16,20]. METER is based on word/non-word recognition and is open-use, very brief, and self-administered, which means it can be added to a form or questionnaire without increasing participant burden considerably. We aimed to culturally adapt and validate METER in the Portuguese population, and to define cut-off values for adequate health literacy.

2. Methods

2.1. Original instrument

METER is an English language open use instrument based on REALM, consisting of a list of 40 medical words and 30 made-up non-words that intuitively sound like real medical terms. It is self-administered and it takes on average two minutes to complete. The participants are requested to mark only the words they are sure to be actual words. The score is calculated as the sum of all the correct words marked. The original METER performance cut-off points defined by the authors were 0–20 for low, 21–34 for marginal and 35–40 for functional health literacy levels [10].

2.2. Cross-cultural adaptation

We used the standard procedure for word adaptation [21]. An expert committee (with backgrounds in Family Medicine, Internal Medicine, Pharmacy, Psychology, and Sociology) ensured conceptual and item equivalence. Afterwards, two native Portuguese speakers proficiently fluent in English translated METER independently and merged the translations into a single Portuguese version. Next, two native English speakers, proficient in Portuguese, independently back-translated this version. They were unaware of the purpose of the instrument and had not seen the original version. The translators arrived at a consensus back-translated version, which was then revised and compared to the original by the committee, resolving any discrepancies between the two versions.

For the non-words, we surveyed 25 health professionals to identify common misspellings and build up constructions based on real medical terms, 30 of which were selected by the research team for inclusion in the instrument. The selection criteria were to avoid redundancy and to maximize diversity of conceptual areas.

This version was pre-tested in a small group of six lay people and the instructions wording was adjusted for the sake of clarity.

2.3. Sample and recruitment

The adapted version of the test was administered to a convenience sample of 249 people from several heterogeneous groups: physicians (from public hospitals and primary care health centers), health researchers (from a research institute), researchers from areas unrelated to health (from an engineering faculty), and general population (from a primary care health center). In the absence of prevalence data of inadequate health literacy in this population, the sample size was estimated based on other validation studies [8,11,12]. To assess construct validity we assumed that physicians would score highest on health literacy tests, followed by health researchers, people with a similar academic degree in areas unrelated to health, and by people with progressively lower levels of education attainment.

Eligibility criteria for the participants were age over 18 years and ability to speak and read Portuguese. Potential participants with impaired vision were excluded. The instrument was re-administered to a convenience group (45 health researchers) after a three-month interval to assess test–retest reliability. This rather long test–retest interval of time aimed to reduce mnesic/learning bias.

The present investigation was carried out in accordance with the Code of Ethics of the Declaration of Helsinki and approved by the Ethics Committee of Centro Hospitalar de São João and the National Committee for Data Protection. Each participant provided written informed consent.

2.4. Cut-off definition

In the absence of a gold standard, cut-offs were defined using the modified Angoff procedure, a content-procedure method extensively applied for establishing absolute assessment criteria [22]. It is based on expert judgment of minimal competence of marginally competent individuals: a panel of judges trained in the use of the method discusses and agrees on the characteristics of a examinee scoring "borderline" for adequate health literacy and independently classifies each item according to the question *"Can a person with minimal competence answer the item correctly?"*, given a three-choice option of *"yes"*, *"no"* or *"don't know"*. An average of the scores of the judges is calculated to provide a passing score (the cut-off). The judges are allowed to review and discuss the initial scores and are given the option to independently alter their own classification if they wish to; this strategy usually does not change cut-offs meaningfully but reduces variability between judges [23]. The panel comprised six health literacy experts (with backgrounds in Family Medicine, Internal Medicine, Pharmacy, Psychology, and Sociology).

We used this method to dichotomize health literacy levels into adequate or inadequate in order to help guide decisions to tailor patient education and communication interventions to the patients' needs, both in future research and clinical practice.

2.5. Statistical analysis

Exploratory factor analysis was performed on the 70 items to evaluate homogeneity (i.e., to confirm there was a single latent variable measuring word recognition) and Cronbach's alpha was used to measure internal consistency. An item was considered to load in a determined factor when it showed an absolute factor loading higher than 0.4.

Physicians were excluded from these analyses, since they are not targets of the instrument. The global goodness of fit of the underlying model was evaluated using the comparative fit index (CFI), recommended for sample sizes below 250 [24].

Logistic regression was used to compare the prevalence of adequate health literacy across validation groups, adjusting for age.

Test–retest reliability was assessed using the standard error of measurement and respective two-way mixed intra-class correlation coefficient single-measure (ICC).

Exploratory factor analysis models were fitted using MPlus (V.5.2; Muthen & Muthen, Los Angeles, California, USA). All other statistical analyses were performed using Stata version 11.1 for Windows (StataCorp LP, College Station, TX).

3. Results

Demographic characteristics of the sample by validation group are summarized in Table 1. Women made up the majority of respondents in all validation groups (56.6%), except for the group of researchers in areas unrelated to health (12.0%). Less educated people were older.

Table 1
Demographic characteristics of the sample by validation group.

Validation group	*n*	Age in years, mean (SD)	Women, *n* (%)
Physicians	53	32.3 (7.1)	34 (64.2)
Health researchers	45	29.6 (5.6)	37 (82.2)
Other researchers	50	43.8 (13.0)	6 (12.0)
General population			
College education	18	41.6 (13.7)	11 (61.1)
12th grade	15	34.8 (11.1)	8 (53.3)
9th–11th grade	22	38.5 (12.4)	14 (63.6)
5th–8th grade	17	41.4 (14.0)	10 (58.8)
≤4th grade	29	61.1 (9.2)	21 (72.4)

SD—standard deviation.

3.1. Exploratory factor analysis

The scree plot curve inflected at the second component, revealing two underlying dimensions of the instrument (Fig. 1). Exploratory factor analysis confirmed these two dimensions, with almost all the items representing real words being included in the first dimension, and all the non-words in the second (Table 2). The CFI of the model improved from 0.83 in the uni-dimensional model to 0.93 with the two dimensions.

Fig. 2 depicts the plot of the percentage of correctly marked words against the percentage of non-words that were correctly not selected. The former ranged from 15 to 100%, whereas the latter from 45 to 100%. These two dimensions were poorly correlated ($r = 0.22$) and three patterns emerged, visually: a group of people scoring over two-thirds in both; a group scoring lower in the identification of real words and a group scoring lower in non-words. No one correctly identified less than two-thirds of both words and non-words.

3.2. Reliability

METER showed a high degree of reliability, with a Cronbach's alpha of 0.92 for the first dimension and 0.83 for the second. In the retest study after three months, the standard error of measurement was 1.54 for the words (ICC 0.49) and 0.82 for the non-words (ICC 0.61).

3.3. Cut-off definition

The final cut-offs defined by the judging panel using the Angoff method were 35 correct answers in the words subscale and 18 correct answers in the non-words subscale. The review, discussion and experts' independent adjustment of the initial scores kept cut-offs roughly unchanged (the cut-off for non-words increased by one point in the second round and the cut-off for words remained constant) and reduced the variability between judges (the standard deviations decreased from 3.45 to 1.21 and from 2.71 to 1.50, for non-words and words, respectively).

We used these cut-offs to categorize health literacy as inadequate or adequate; adequate was defined as scoring at least the cut-off value in both words and non-words, i.e. ≥35/40 and ≥18/30, respectively.

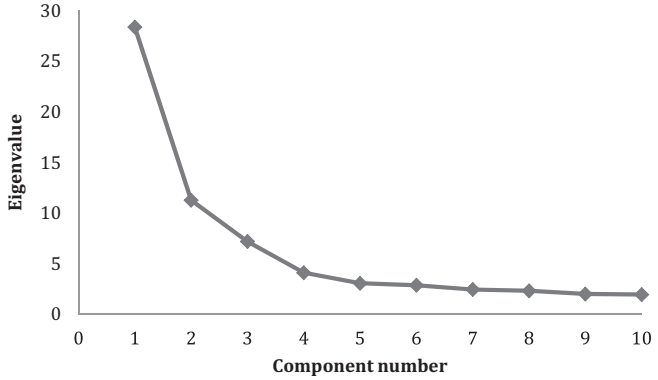

Fig. 1. Scree plot of eigenvalues after exploratory factor analysis.

3.4. Validity

Physicians scored higher than any other group, followed by health researchers, non-health researchers and by people with progressively lower levels of education (Fig. 3). The age-adjusted prevalence of adequate health literacy increased consistently across validation groups (OR = 2.79 for physicians, compared to people with education attainment below the fourth grade; p for trend <0.001).

4. Discussion and conclusion

4.1. Discussion

We culturally adapted a health literacy instrument that is brief and simple, and showed it was valid and reliable. This instrument can be used to assess health literacy levels and to sort between adequate and inadequate health literacy. We propose that words and non-words should be treated as different sub-scales with separate scoring.

Exploratory factor analysis revealed two dimensions of the instrument, one for words and another for non-words, implying that some individuals scored high in one dimension and low in the other. Because of the design of the original instrument, in which the participants are required to mark only the words they are sure to be actual words and not individually mark each item as true or false, the non-word items likely measure more than merely word recognition. The results suggest that this dimension also measures risk aversion, i.e. individuals more averse to error mark less words and non-words, thus scoring lower in the words sub-scale and higher in the non-word subscale; the opposite applies to less cautious individuals. The fact that no one scored very low in both dimensions supports this interpretation. With the original scoring instructions (total score as the sum of all the correct words marked), in the unlikely event that a participant marked all of the items, he/she would achieve the maximum score, even though that would not correspond to adequate health literacy. Therefore, scoring the two dimensions independently and then combining the performance on both sub-scales will reduce the misclassification of individuals with inadequate health literacy.

The rare exceptions to the perfect correspondence between words and non-words and each of the two dimensions were items 4 (a word that could fit in either dimension), item 37 (a non-word that could fit in either dimension), and item 47 (a word that does not fit in either dimension). Only one individual neglected to correctly mark item 4 as a word, and this might have misestimated the correlation due to ceiling effects, loading the item in both dimensions. Item 37 is one of the good examples of the effect of the small but significant correlation between the first and second dimensions - several items partially cross-loaded in both (as can be observed by the small factor loading differences between factors one and two). Item 47 is "impetigo", a contagious skin infection which causes sores and blisters, and relatively unfamiliar to lay people. Very few non-physicians correctly selected this word and this could explain why it does not fit in either dimension; it seems to be almost exclusively recognized by health professionals. Our finding is consistent with the word frequency effect in word

Table 2
Correct answers per item in words and non-words, and standardized factor loadings for one and two factors in exploratory factor analysis.

			Correct answers *n* (%)	Standardized factor loadings		
				One factor	Two factors	
					Factor 1	Factor 2
Words	Portuguese	English				
METER 2	Artrite	Arthritis	173 (88.3)	0.729	**0.847**	−0.104
METER 3	Obesidade	Obesity	183 (93.4)	0.849	**0.952**	−0.105
METER 4	Gripe	Flu	195 (99.5)	0.893	0.424	**0.758**
METER 6	Sífilis	Syphilis	148 (75.5)	0.668	**0.885**	−0.280
METER 7	Potássio	Potassium	161 (82.1)	0.746	**0.861**	−0.108
METER 8	Hormonas	Hormones	178 (90.8)	0.745	**0.819**	−0.015
METER 9	Nervos	Nerves	191 (97.4)	0.647	**0.600**	0.224
METER 14	Exercício	Exercise	176 (89.8)	0.650	**0.745**	−0.015
METER 15	Pústula	Pustule	63 (32.1)	0.187	**0.587**	−0.450
METER 17	Rim	Kidney	192 (98.0)	0.882	**0.890**	0.142
METER 18	Urgência	Emergency	185 (94.4)	0.617	**0.633**	0.115
METER 20	Menopausa	Menopause	192 (98.0)	0.769	**0.794**	0.146
METER 21	Diagnóstico	Diagnosis	182 (92.9)	0.906	**0.947**	−0.019
METER 23	Icterícia	Jaundice	110 (56.1)	0.466	**0.769**	−0.333
METER 24	Bexiga	Bladder*	191 (97.4)	0.907	**0.900**	0.131
METER 25	Aborto	Miscarriage	192 (98.0)	0.888	**0.870**	0.175
METER 26	Hepatite	Hepatitis	189 (96.4)	0.927	**0.945**	0.047
METER 29	Asma	Asthma	192 (98.0)	0.898	**0.897**	0.151
METER 30	Inflamatório	Inflammatory	185 (94.4)	0.734	**0.836**	−0.019
METER 31	Anemia	Anemia	190 (96.9)	0.880	**0.923**	0.054
METER 34	Stress	Stress	186 (94.9)	0.848	**0.906**	−0.003
METER 39	Cancro	Cancer	192 (98.0)	0.902	**0.878**	0.145
METER 41	Antibióticos	Antibiotics	191 (97.4)	0.870	**0.893**	0.104
METER 43	Colite	Colitis	116 (59.2)	0.225	**0.542**	−0.306
METER 44	Diabetes	Diabetes	194 (99.0)	0.896	**0.754**	0.394
METER 47	Impetigo	Impetigo	10 (5.1)	−0.306	0.059	−0.561
METER 48	Menstrual	Menstrual	186 (94.9)	0.710	**0.797**	0.014
METER 50	Convulsão	Seizure	175 (89.3)	0.833	**0.882**	−0.007
METER 51	Apêndice	Appendix	184 (93.9)	0.866	**0.938**	−0.058
METER 54	Dose	Dose	166 (84.7)	0.754	**0.895**	−0.187
METER 55	Hemorróidas	Hemorrhoids	161 (82.1)	0.303	**0.396**	−0.017
METER 56	Testículo	Testicle	186 (94.9)	0.931	**0.982**	−0.065
METER 57	Olho	Eye	192 (98.0)	0.851	**0.850**	0.174
METER 61	Sexualmente	Sexually	179 (91.3)	0.596	**0.674**	0.018
METER 64	Medicação	Medication*	191 (97.4)	0.731	**0.759**	0.131
METER 65	Micróbios	Germs	174 (88.8)	0.527	**0.559**	0.079
METER 66	Gonorreia	Gonorrhea	120 (61.2)	0.529	**0.820**	−0.342
METER 68	Fadiga	Fatigue	185 (94.4)	0.778	**0.841**	0.020
METER 69	Osteoporose	Osteoporosis	186 (94.9)	0.642	**0.670**	0.102
METER 70	Obstipação	Constipation	146 (74.4)	0.518	**0.742**	−0.184
Non-words						
METER 1	Imígdala	N/A	176 (89.8)	0.345	0.120	**0.346**
METER 5	Nervosite	N/A	173 (88.3)	0.665	0.312	**0.551**
METER 10	Anquia	N/A	195 (99.5)	0.868	0.426	**0.759**
METER 11	Cástula	N/A	195 (99.5)	0.889	0.426	**0.757**
METER 12	Ingesto	N/A	173 (88.3)	0.345	−0.081	**0.581**
METER 13	Intestigo	N/A	181 (92.3)	0.335	−0.023	**0.520**
METER 16	Cerpes	N/A	194 (99.0)	0.650	0.381	**0.565**
METER 19	Xirope	N/A	187 (95.4)	0.623	0.370	**0.458**
METER 22	Candíase	N/A	167 (85.2)	0.122	−0.298	**0.540**
METER 27	Enatoma	N/A	185 (94.4)	0.575	0.223	**0.552**
METER 28	Unhal	N/A	190 (96.9)	0.455	0.031	**0.723**
METER 32	Linsoma	N/A	182 (92.9)	0.328	−0.022	**0.509**
METER 33	Ceresiana	N/A	158 (80.6)	0.336	−0.014	**0.472**
METER 35	Algérico	N/A	173 (88.3)	0.295	0.067	**0.337**
METER 36	Jezum	N/A	166 (84.7)	0.393	0.174	**0.345**
METER 37	Súrgico	N/A	191 (97.4)	0.643	**0.440**	0.378
METER 38	Malorias	N/A	195 (99.5)	0.868	0.426	**0.759**
METER 40	Alcoolidade	N/A	160 (81.6)	0.294	−0.107	**0.510**
METER 42	Antideprimido	N/A	170 (86.7)	0.395	−0.111	**0.640**
METER 45	Otorringologista	N/A	138 (70.4)	0.221	−0.096	**0.374**
METER 46	Nósea	N/A	189 (96.4)	0.491	0.116	**0.635**
METER 49	Gatarral	N/A	192 (98.0)	0.444	0.138	**0.572**
METER 52	Abdominável	N/A	151 (77.0)	0.352	−0.129	**0.579**
METER 53	Enxuteca	N/A	192 (98.0)	0.589	0.244	**0.622**
METER 58	Obstérico	N/A	183 (93.4)	0.382	−0.205	**0.812**
METER 59	Sonambulação	N/A	168 (85.7)	0.321	−0.211	**0.664**
METER 60	Drenação	N/A	153 (78.1)	0.136	−0.323	**0.548**

Table 2 (*Continued*)

			Correct answers *n* (%)	Standardized factor loadings		
				One factor	Two factors	
					Factor 1	Factor 2
METER 62	Purisia	N/A	193 (98.5)	0.594	0.161	**0.762**
METER 63	Fibrómico	N/A	184 (93.9)	0.421	−0.076	**0.707**
METER 67	Estómico	N/A	185 (94.4)	0.571	0.117	**0.700**
Cronbach's alpha				0.894	0.916	0.828

N/A: English not applicable for the non-words.
* Literal translation to English instead of the original version when Portuguese words were adjusted to maintain semantic and/or structural equivalence.

recognition, in which low frequency words are less often recognized as words [25].

The instrument had a high internal consistency (Cronbach's alpha $\geq$ 0.80) in both domains, similar to that of the original instrument (Cronbach's alpha = 0.93) [10] and of other health literacy tests [13,14].

The test–retest reliability was only reasonably acceptable as it is context-specific and depends on how much participants differ from each other. Even if the variability between the results in the two trials is negligible, the ICC will be small if the retest group is homogenous [26], as was the case in the group of health researchers, which is a limitation of this study.

The cut-off for the non-words could be underestimated by the Angoff method because the way it is done does not reflect the instrument's instructions, previously mentioned. It may have been hard for the judges to keep coming back to the concept that the test score default for non-words is inaction and that this corresponds to maximum score. Answering "yes/no/don't know" to the question of whether a minimally competent individual would answer the question correctly is more suitable to items with a true/false format. Despite the good performance of the final version of the instrument in discriminating the several validation groups, further studies comparing the performance of the non-word subscale with that of other health literacy tests are needed.

Different health literacy assessment instruments categorize health literacy scores into a variable number of categories in addition to providing a continuous score [27]. We decided to dichotomize the scores into adequate and inadequate instead of maintaining the three categories of the original instrument to simplify the decision-making regarding health education interventions for patients with inadequate health literacy, both in research and clinical settings.

Some validation studies of health literacy instruments have used concurrent validation, that is, through the comparison with an existing instrument. This is a controversial option given the multiple proposed definitions of the underlying construct [28] and the diverse and restrictive scope of the instruments [27]. There is just no way to tell which one better represents health literacy. Our strategy assumed that health literacy should be higher in physicians, followed by health researchers, people with a similar academic degree in areas non-related to health and by people with progressively lower levels of education attainment. The data confirm this hypothesis and this suggests that the instrument measures more than educational attainment, but we cannot exclude the possibility of it not measuring more than the ability to recognize medical jargon—only one of the aspects of health literacy. Furthermore, METER and other word recognition tests do not directly address the individual ability of accessing, understanding, processing and communicating information that is included in the health literacy construct; vocabulary knowledge plays only a small part in these competencies. However, the score in these instruments is associated with other clinically relevant health measures and may be used to screen for individuals who could use more help in understanding and acting on health information. The comparison with the performance of other health literacy instruments may shed some light on this issue by exploring the need to use multiple instruments simultaneously to assess health literacy.

4.2. Conclusion

We culturally adapted and validated METER in the Portuguese population and defined cut-off values for adequate health literacy. This instrument distinctly differentiates individuals based on educational attainment and health-related occupation, in spite of measuring only vocabulary knowledge—a small part of the health literacy construct. Future studies should reveal how it performs when used together with health literacy instruments not based on word recognition.

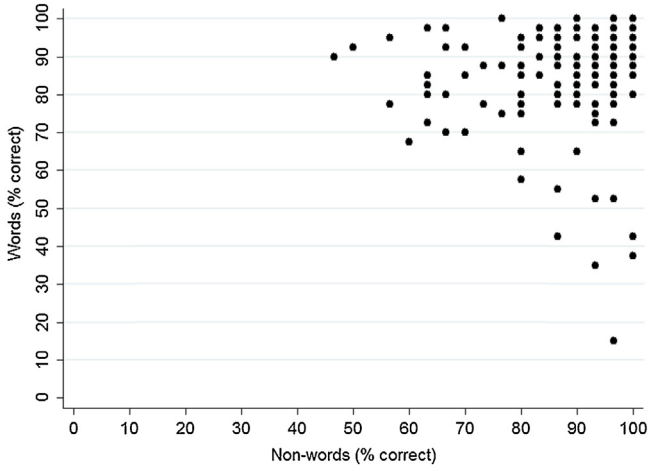

Fig. 2. Percent correct answers in words and non-words in METER.

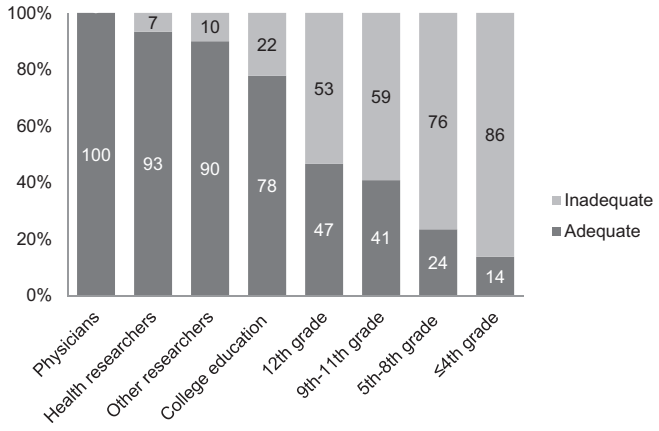

Fig. 3. Health literacy by validation group.

4.3. Practice implications

The Portuguese version of METER can be used to assess health literacy in Portuguese adults and to explore associations with health outcomes. Further studies are needed to determine the usefulness of this instrument as a screening tool and decision-aid in clinical settings, either used on its own or in combination with other health literacy assessment tests.

Measuring the health literacy of Portuguese adults can highlight the issue of inadequate health literacy in the national political agenda, and raise awareness by the general population. In turn, this could indirectly promote system changes to improve the communication of health information, namely by encouraging strategies that enhance comprehension by health consumers. These strategies will benefit not only those with inadequate health literacy but potentially everybody.

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Appendix A

Validated version of the instrument

A lista seguinte inclui alguns termos que existem na linguagem médica. Alguns desses termos estão relacionados com partes ou funções do corpo, com tipos de doenças ou com coisas que podem melhorar ou piorar a saúde. A lista também contém algumas palavras que podem parecer ou soar como termos reais, mas que não existem.

À medida que for lendo esta lista, coloque uma cruz "X" ao lado das palavras que são termos reais. Não tente adivinhar. Coloque uma cruz "X" ao lado das palavras só quando tiver a certeza que existem mesmo.

_____ Imígdala	_____ Jezum
_____ **Artrite**	_____ Súrgico
_____ **Obesidade**	_____ Malorias
_____ **Gripe**	_____ **Cancro**
_____ Nervosite	_____ Alcoolidade
_____ **Sífilis**	_____ **Antibióticos**
_____ **Potássio**	_____ Antideprimido
_____ **Hormonas**	_____ **Colite**
_____ **Nervos**	_____ **Diabetes**
_____ Anquia	_____ Otorringologista
_____ Cástula	_____ Nósea
_____ Ingesto	_____ **Impetigo**
_____ Intestigo	_____ **Menstrual**
_____ **Exercício**	_____ Gatarral
_____ **Pústula**	_____ **Convulsão**
_____ Cerpes	_____ **Apêndice**
_____ **Rim**	_____ Abdominável
_____ **Urgência**	_____ Enxuteca
_____ Xirope	_____ **Dose**
_____ **Menopausa**	_____ **Hemorroidas**
_____ **Diagnóstico**	_____ **Testículo**
_____ Candíase	_____ **Olho**
_____ **Icterícia**	_____ Obstérico
_____ **Bexiga**	_____ Sonambulação
_____ **Aborto**	_____ Drenação
_____ **Hepatite**	_____ **Sexualmente**
_____ Enatoma	_____ Purisia
_____ Unhal	_____ Fibrómico
_____ **Asma**	_____ **Medicação**
_____ **Inflamatório**	_____ **Micróbios**
_____ **Anemia**	_____ **Gonorreia**
_____ Linsoma	_____ Estómico
_____ Ceresiana	_____ **Fadiga**
_____ **Stress**	_____ **Osteoporose**
_____ Algérico	_____ **Obstipação**

Correct answers in boldface.

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